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Time-series identification on fish feeding behaviour (Book Chapter)

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Abstract

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The identification of relevant parameters that could describe the state of fish hunger is vital for ensuring the appropriate allocation of food to the fish. The establishment of these relevant parameters is non-trivial, particularly when developing an automated demand feeder system. The present inquiry is being undertaken to determine the hunger state of *Lates calcarifer*. For data collection, a video analysis system is used, and the video was taken all day, where the fish was fed by an automatic feeding system. Sixteen characteristics of the raw data set have been extracted through feature engineering for 0.5 min, 1.0 min, 1.5 min and 2.0 min, respectively, in accordance with the mean, peak, minimum and variability of each of the different time window scales. Furthermore, the features extracted have been evaluated through principal component analysis (PCA) both for dimension reduction and PCA with varimax rotation. The details were then categorized using support vector machine (SVM), K-NN and random forest tree (RF) classifiers. The best identification accuracy was shown with eight described features in the varimax-based PCA. The forecast results based on the K-NN model built on selected data characteristics showed a level of 96.5% indicating that the characteristics analysed were crucial to classifying the actions of hunger among fisheries. © The Author(s), under exclusive license to Springer Nature Singapore Pte Ltd 2020.

SciVal Topic Prominence ⓘ

Topic: Feeding Frequency | Fish Feeds | Specific Growth Rate

Prominence percentile: 81.716



Author keywords

Automated demand feeder

Image processing

Lates calcarifer

Pixel intensity

Specific growth rate

Indexed keywords

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controlled terms:

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Feeding

Fish

Image processing

Materials handling equipment

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Introduction

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Engineering
uncontrolled terms

Automated demand feeder Automatic feeding systems Different time windows
Feature engineering Identification accuracy Lates calcarifer Pixel intensities
Specific growth rate

Engineering main
heading:

Principal component analysis

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